PINAL AIRPARK MASTER PLAN

Prepared for the
County of Pinal

CHAPTER 7
AIRPORT PLANS

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Chapter Six evaluated several scenarios for the long-term development of Pinal Airpark. The preferred alternative, developing Runway 12-30 to an ultimate length of 8,400 feet, remained the choice of the Planning Advisory Committee (PAC) and the interested public. However, based on subsequent discussions with Evergreen Air Center, Pinal County, and other Airpark users, additional refinements were made to the preferred alternative in order to better address potential long-term operational needs of existing and prospective users.

The preferred alternative initially involved a 1,550-foot northern extension of Runway 12-30 and the parallel taxiway. This approach has been modified to increase the extension by 1,600 feet, for a total of 3,150 feet. Recent discussions with Evergreen suggest that a runway length of 8,400 feet would provide only limited expansion of current operational capabilities. As noted in the facility requirements analysis in Chapter Five, the existing length of Runway 12-30 does affect current operations (fuel and payload) during the hottest months of the year. However, the typical operating requirements of these aircraft—which utilize Pinal Airpark for maintenance, training, or long-term storage—do not significantly exceed current runway capabilities.

Evergreen has indicated that, while an 8,400-foot runway would be useful, a length of 10,000 feet would be needed to significantly expand their operating capabilities. The highest operational priority within Evergreen is currently related to maintaining the existing runway/taxiway system in a fully serviceable condition. Extending Runway 12-30, while generally beneficial, is not considered essential to the company's current operational requirements.

The preferred alternative allows the future utilization of the Airpark by large aircraft operated by Evergreen Air Transport or other companies performing aircraft maintenance services or other activities which utilize large aircraft. The extension of the existing runway allows the maximum use of the remaining airfield for the storage of aircraft of all sizes. The selection of any other alternative would have required the reduction of the airfield storage area, a very valuable resource for the airport. Therefore, based on updated information and definition of user requirements, the preferred alternative concept was modified to include a 3,150-foot extension of Runway 12-30. This project is considered a long-term improvement for the Airpark. Future master plan updates will reexamine project priority and scheduling within a five- to ten-year time period in order to determine any necessary adjustments.

The selected development plan is a modification of the preferred alternative outlined in Chapter Six. It was agreed that the runway extension should be built at the north end of the runway rather than extending both ends of the runway. The main reason for the original plan to extend both ends of the existing runway was to avoid relocation of the

Army National Guard's helicopter landing pads. However, the close proximity of the helipads to the existing and extended parallel taxiway centerline will require relocation of the helipads. There are three existing and two planned helicopter landing pads that would cause operational problems for the longer runway. Army National Guard staff members recognize that moving the helicopter landing pads approximately 55 feet east of their current locations would be necessary to accommodate the runway extension and parallel taxiway. This would allow sufficient clearance from the centerline of the taxiway to the edge of the helicopter landing pads. Communications with the Army National Guard regarding the location of the helipads and other future facilities will continue.

The purpose of this chapter is to describe the plans in narrative and graphic form, depicting the recommendations for the airfield layout and future land use on the airport. The set of plans includes the following:

- Airport Layout Plan
- Airport Airspace Plan
- Approach and Runway Protection Zone Plan
- Land-Use Plan

AIRFIELD DESIGN STANDARDS

The analyses conducted in previous chapters have defined the role of Pinal Airpark and the types of aircraft forecast to use it. Accordingly, Pinal Airpark has been identified as a Transport category airport that should be planned and designed to accommodate large Transport category aircraft. The Boeing 747-200 was selected as the critical design aircraft for Pinal Airpark due to the large number of B-747s that use the airport on a regular basis. The B-747 is included in FAA Airplane Design Group (ADG) V and Aircraft Approach Category D. ADG V dimensional criteria are intended for aircraft with wingspans of 171 feet up to, but not including, 214 feet. Approach Speed Category D aircraft have approach speeds of 141 knots or more, but less than 166 knots. Based on the design and operating specifications of the critical aircraft, an FAA Airport Reference Code (ARC) D-V is appropriate for Pinal Airpark. These standards, contained in FAA Advisory Circulars, have provided the guidelines for planning Pinal Airpark and are summarized in **Table 7-1.**

It is important to note that the design standards used in this Master Plan must be followed to ensure compliance with federal criteria as well as to provide for safety and efficiency of the airport. Based upon the present and foreseeable role of the Airpark, all proposed development must be planned in accordance with the standards summarized in **Table 7-1.** Where deviations from current standards exist, efforts should be made to correct deficiencies, if practical. If deficiencies cannot be practically corrected, a deviation from standards may be approved by the FAA. Failure to comply with applicable design standards could result in loss of eligibility for future FAA airport development funding.

Table 7-1
AIRFIELD DESIGN - EXISTING AND FAA STANDARDS
Pinal Airpark Airport Master Plan

	RUNWAY 12-30	
	EXISTING[a]	FAA STANDARDS[b]
RUNWAYS:		
Length (ft)	6,850	8,400[c]
Width (ft)	150	150
Primary Surface (ft)	1,000	1,000
Strength (lbs)	120,000 DWL[d]	150,000 DWL[d]
TAXIWAYS:		
Width (ft)	50	75
Strength (lbs)	50,000 DWL[d]	150,000 DWL[d]
RUNWAY CENTERLINE TO:		
Taxiway Centerline (ft)	490	450
Building Restriction Line (ft)	750	750
Aircraft Parking Areas (ft)	500	500

NOTES:

[a] Sources: Approved Airport Layout Plan and FAA Form 5010-1.
[b] Based on dimensional standards for Transport airports, Airplane Design Group V, per FAA A/C 150/5300-13.
[c] Based on future "critical" aircraft conditions, per FAA A/C 150/5300-13.
[d] DWL = Dual-wheel loading.

The ultimate runway length of Runway 12-30, as shown on the Airport Layout Plan, is 10,000 feet, with a width of 150 feet. In addition, a 150,000-pound dual-wheel loading (DWL) weight-bearing capacity for the runway is standard for this level of Transport category aircraft usage. However, the present strength and condition of the existing runway could impose long-term limitations on such aircraft, and pavement integrity can be degraded over time through repeated use by aircraft exceeding the runway's existing weight-bearing capacity. Therefore, a pavement testing program should be planned for Runway 12-30 to determine the runway's true strength and condition. It is recommended that the pavement strength of Runway 12-30 be adequate to accommodate more frequent use by the larger and heavier Transport-class aircraft mentioned previously.

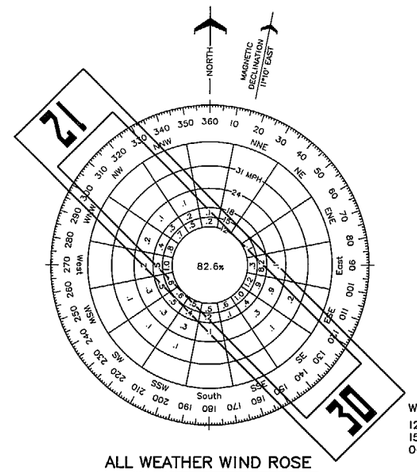
Pavement standards for future construction on the airport should be specified according to the intended use. The cost assumptions in Chapter Six for the runway and future large aircraft apron were based upon a weight-bearing capacity of 150,000 pounds DWL. Depending upon the nature of air service at Pinal Airpark in the future, aprons must also be provided to accommodate those aircraft weighing 240,000 pounds or greater.

AIRPORT LAYOUT PLAN (ALP)

The Airport Layout Plan (**Drawing 1**) is a graphic depiction of the existing airport facilities, dimensional standards, and proposed development through the year 2010. The ALP provides the basis for preparing the development program, and it represents the recommended improvements which will be needed to meet forecast aviation demand. Specific airport, runway, and taxiway data are provided on the ALP, summarizing current conditions and master planning recommendations.

The ALP depicts a number of improvements for both airside and landside areas of the Airpark. The initial improvements at Pinal Airpark will be primarily directed toward the rehabilitation of pavement and maintenance of existing airfield facilities. Several existing airfield facilities have deteriorated significantly and require immediate attention in order to accommodate current activity. Other short-term improvements include providing blast protection for the ANG helipads and operating areas; the installation of DOD-sponsored airfield lighting systems; and rehabilitation of the main apron. Expansion of the apron and extension of the runway/taxiway are identified as longer term improvements. Other long-term airport improvements also include the continued rehabilitation and upgrading of airport and airfield facilities due to normal wear and tear. Continued development of the industrial park and related roadway system are also included as long-term improvements.

RUNWAY DATA BLOCK			
		12–30 EXISTING	12–30 ULTIMATE
% EFFECTIVE GRADIENT		0.248%	SAME
% WIND COVERAGE 12 MPH		96.6%	SAME
MAX ELEVATION ABOVE MSL		1891	SAME
RUNWAY LENGTH		6850'	10,000'
RUNWAY WIDTH		150'	SAME
SURFACE TYPE		ASHALT	SAME
TAXIWAY WIDTH		50'	75'
APPROACH SLOPE		34:1–34:1	SAME
PAVEMENT STRENGTH IN 1000 LBS.		30SW, 100DW, 150DTW	" SAME
RUNWAY LIGHTING		LIRL	HIRL
RUNWAY MARKING		NON–PRECISION INST.	SAME
NAVIGATIONAL AIDS		NONE	NDB/DME
VISUAL AIDS		NONE	VASI, REILS
RUNWAY SAFETY AREA DIMENSIONS:			
LENGTH BEYOND RUNWAY END		1000'	SAME
WIDTH		500'	SAME
RUNWAY CATEGORY		TRANSPORT	SAME
FAR PART 77 CATEGORY		NPI	SAME
RUNWAY END COORDINATES	R/W 12	32°30'59" LAT.(N) 111°19'57" LONG.(W)	32°31'21" LAT. (N) 111°20'23" LONG.(W)
	R/W 30	32°30'11" LAT. (N) 111°19'00" LONG.(W)	SAME SAME



ALL WEATHER WIND ROSE

SOURCE: U.S. DEPARTMENT OF COMMERCE, NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, NATIONAL CLIMATE CENTER ASHERVILLE, NORTH CAROLINA
PERIOD: 1949–1978
NOTE: NO SURFACE WIND INFORMATION AVAILABLE FOR MARANA, AZ. TUCSON, AZ. USED AS REFERENCE SURFACE WIND COMPARISION.

MAG. DEC. 11°10'E (1991)
–5' ANNUAL VARIATION

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SCALE IN FEET

NOTE: 10' CONTOURS FROM 1980, 7 1/2 MIN, RED ROCK, ARIZ. USGS QUADRANGLE.

FACILITIES	
①	AVIATION CENTER
②	CONTROL TOWER
③	FLIGHT READY ROOMS
④	HANGARS
⑤	BASE SHOPS
⑥	WAREHOUSE
⑦	FUEL FARM (ABOVE GROUND)
⑧	CAFETERIA
⑨	MOTEL
⑩	THEATER
⑪	OFFICES
⑫	FEDERAL LAW INFORCEMENT TRAINING TRACK
⑬	AUTO PARKING
⑭	D.O.D. HEADQUARTERS

LEGEND		
	INITIAL	ULTIMATE
FACILITIES		
BUILDINGS		
AIRPORT PROPERTY LINES		
RUNWAY SAFETY AREA (RSA)		
BUILDING RESTRICTION LINE (BRL)		
FENCE		
TOPOGRAPHIC CONTOUR	1236	1236
AIRPORT REFERENCE POINT (ARP)		
DITCH FLOW LINE		
DEPT. OF DEFENCE LAND		
RUNWAY LIGHTING	LIRL	HIRL

AIRPORT DATA		
	EXISTING	ULTIMATE
AIRPORT ELEVATION (MSL)	1891	SAME
AIRPORT REFERENCE POINT COORDINATES	32°30'35" LAT (N) 111°19'30" LONG (W)	32°30'46" LAT (N) 111°19'42" LONG (W)
TERMINAL NAVIGATION AIDS	–	–
NORMAL MAX. TEMP. HOTTEST MONTH	102.8° JULY	SAME
AIRPORT TYPE	TRANSPORT	SAME
DESIGN AIRCRAFT	B–747	SAME
AIRPORT REFERENCE CODE	D–V	SAME

NO.	REVISION	BY	APPROVED	DATE

AIRPORT LAYOUT PLAN
PINAL AIRPARK
MARANA, ARIZONA

FEDERAL AVIATION ADMINISTRATION		COUNTY OF PINAL	
SIGNATURE	APPROVAL DATE	SIGNATURE	APPROVAL DATE

ENGINEERING COMPANY
2151 Michelson
Suite 252
Irvine, California 92715
(714) 476–2826

DESIGNED BY: J. HANLEY
DRAWN BY: J. FAINKUNEN
DATE: NOVEMBER 1991

The proposed runway extension will ultimately extend Runway 12-30 to a length of 10,000 feet. Evergreen Air Center's long-term development program anticipates the possibility of expanding the Pinal operation from being solely a maintenance and storage facility to being a service and cargo handling destination or transfer location. They anticipate that the aircraft performing this activity will range from Boeing 727 to Boeing 747 type equipment. With the extended runway and existing service base, Pinal Airpark could also attract other operations with similar facility needs.

Demand for the runway extension appears to be long-term; therefore, the extension has been identified in the 10- to 20-year time frame. Additional runway lighting and pavement marking will be required for the runway extension. It is anticipated that the Department of Defense (DOD) lighting installation program will carry over to the extension once it is completed. The long-term extension of Runway 12-30 will require land acquisition and the relocation of the Army National Guard's helicopter landing pads. The current location of the helipads would not provide adequate runway/taxiway separation. The relocation of the existing and planned helipads could be completed late in the current planning period. Current and near-term helicopter operations would not be affected, although future development plans should reflect the relocation of the helipads.

Improvements to the existing taxiway system will include resurfacing and widening the taxiways to a 75-foot width. As noted in earlier chapters, the condition of the existing taxiway has deteriorated, with some sections becoming unusable. The parallel taxiway and five existing access taxiways will be reconstructed during the first stage of development. The existing connecting taxiway to the threshold of Runway 12 will be reconfigured to a standard 90-degree-angle exit taxiway. Taxiway lighting will be added as part of the DOD lighting installation to aid taxiing aircraft during hours of darkness. Long-term taxiway improvements include extending the 75-foot wide parallel taxiway in conjunction with the 3,150-foot runway extension.

Other airfield improvements include the development of designated maintenance run-up areas for large aircraft located on the west side of Runway 12-30. By relocating the maintenance run-ups, the effects of jet blast on helicopter landing areas can be reduced. Jet blast protection will also be installed adjacent to the threshold of Runway 12 to reduce the impact on the helicopter areas.

On the landside portions of the Airpark, improvements to the infrastructure will be required in order to accommodate industrial/commercial development. Extensions of existing access roadways and utilities will be necessary to serve currently undeveloped land areas. A new access road is proposed from the existing main gate area, extending through the commercial/industrial development area, and connecting to the Arizona Army National Guard facilities. The new roadway will also provide the primary access to future aviation and commercial/industrial development along the eastern east side of Runway 12-30. The expansion of the commercial/industrial areas is considered an important step in attracting new business activities to the Airpark. Portions of the existing Runway Protection Zones (RPZ) for Runways 12 and 30 are located beyond Airpark property and should be acquired. Approximately 26 acres of property will be required to control the existing RPZs and protect the existing inner approach surfaces for the runways. In addition, the long-term

extension of Runway 12-30 will require additional land acquisition north of current Airpark boundaries. Approximately 100 acres of land north of the runway would be needed for the runway extension. Land use of the majority of the property is agricultural and, after acquisition, should remain the same.

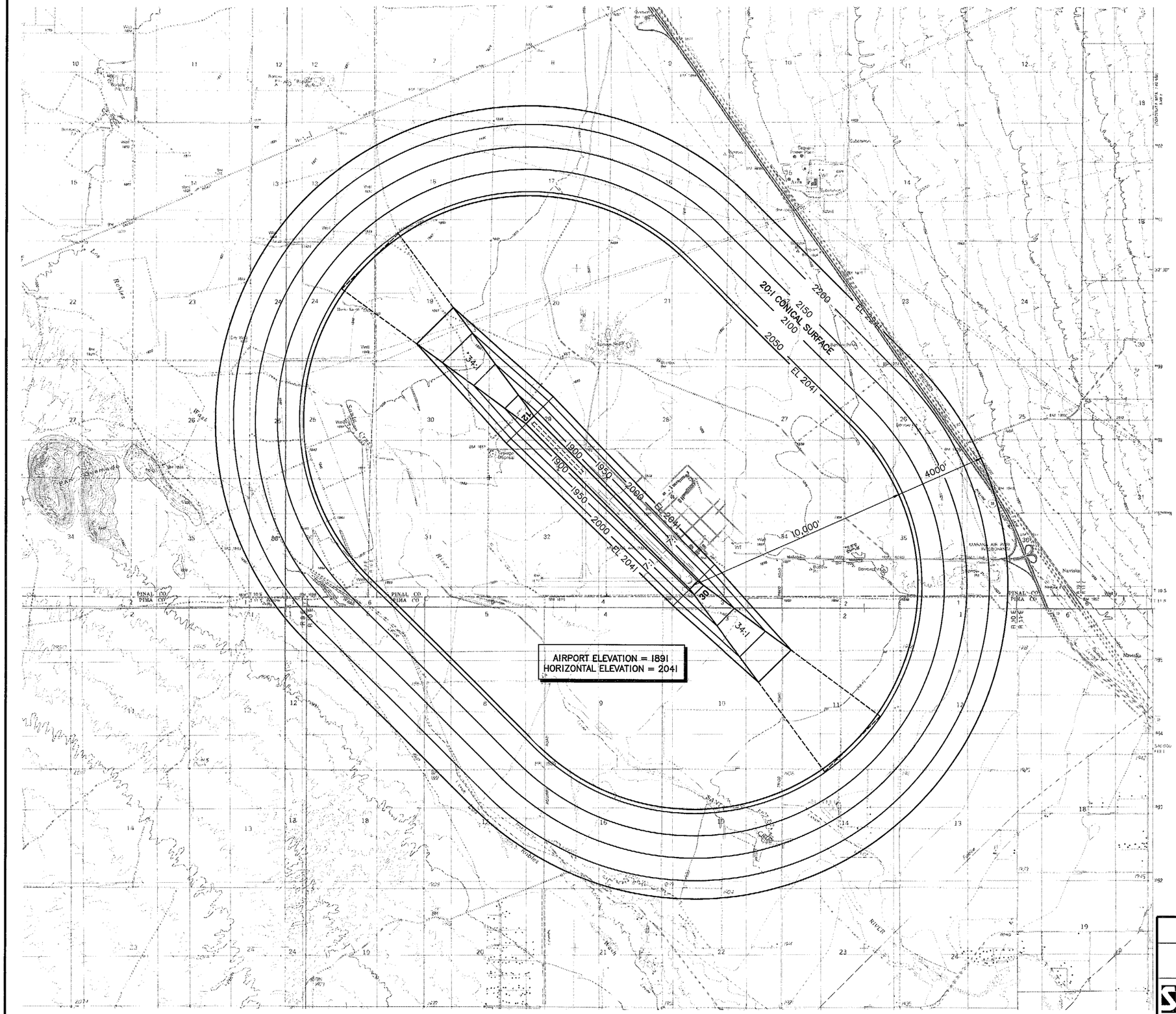
Approximately 500 acres adjacent to the west side of the Airpark is anticipated to be acquired by the Department of Defense. This area is used for high-altitude parachute-jump training by different military organizations. The area will include a strip of land on the southern boundary of the Airpark that includes the closed east-west runway. DOD has indicated an interest in developing a taxiway from the threshold of Runway 30 to their facilities. At the time of preparation of this report, no details of the proposed use of the land area have been presented to the County or Consultant. This is a classified area, and it is possible that no plans will be available for review by the Master Plan effort. The DOD operation has been in existence for a number of years and is considered to be generally compatible with the other Airpark tenant operations. However, the access road to the DOD facilities crosses the future Runway Safety Area, which would extend 1,000 feet beyond the end of Runway 30. The roadway also penetrate the Runway 30 Protection Zone. The roadway should be relocated outside the safety area boundary; this would also provide adequate clearance for the Runway 30 Approach Surface.

It is important to note that the development of Airpark facilities is intended to accommodate a variety of aviation demands while maintaining a high level of economic feasibility and environmental sensitivity. A detailed discussion of project priorities and development staging will be provided in **Chapter Eight, Financial Analysis and Plans.**

AIRPORT AIRSPACE PLAN

The FAR Part 77 Airspace Plan (**Drawing 2**) for Pinal Airpark was developed based on Federal Aviation Regulation (FAR) Part 77, **Objects Affecting Navigable Airspace.** The FAR Part 77 Plan is intended to identify the airspace and approach imaginary surfaces so that existing hazards to safe aeronautical operation can be identified (with appropriate action) and potential encroachments prevented.

The runway type and instrumentation have determined the surface heights, angles, and radii. The Part 77 critical surfaces can be incorporated into zoning and land-use planning efforts for the airport environs. Toward this end, it is recommended that Pinal and Pima Counties and the City of Marana, as well as any other municipality that may later have been formed, adopt or modify, if necessary, the appropriate ordinances to include the requirements of the airspace structure depicted in this Plan. This mechanism would ensure compliance with FAR Part 77 requirements by requiring a review by the appropriate governmental agencies of all building permit applications for property located within ground boundaries of the imaginary surfaces. There are no known physical or terrain penetrations to the runway imaginary surfaces.



GENERAL NOTES:

1. TOPOGRAPHICAL BASE IS MADE FROM 7.5 MIN. QUADRANGLE MAPS OF RED ROCK, ARIZONA (1980), SAMANIEGO HILLS, ARIZONA (1981), SILVER BELL EAST, ARIZONA (PROVISIONAL 1989), WEST OF MARANA, ARIZONA (PROVISIONAL 1989).
2. NO KNOWN PHYSICAL OR TERRAIN OBSTRUCTIONS.

MAG. DEC. 11°10'E (1991)
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AIRPORT AIRSPACE DRAWING

PINAL AIRPARK

MARANA, ARIZONA

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DRAWN BY: _____
DATE: _____

APPROACH AND RUNWAY PROTECTION ZONE PLAN

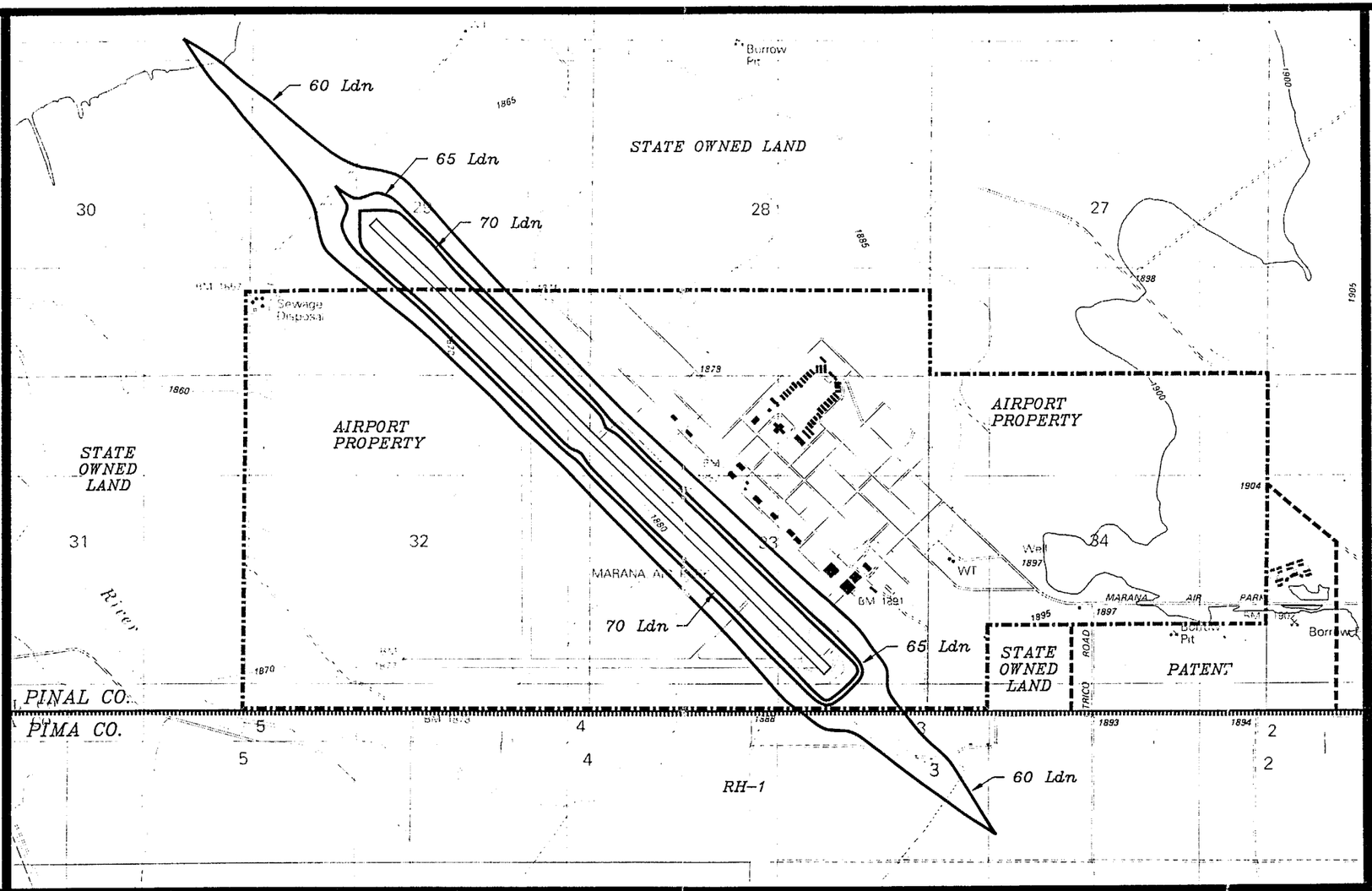
The Approach and Runway Protection Zone (RPZ) Plan (**Drawing 3**) consists of profile views of the outer and inner approach surfaces and a plan view of the Runway Protection Zone. The dimensions and angles of the Runway Protection Zones and approach surfaces are functions of the runway service category and approach classification. The 34:1 approach slopes are based on potential nonprecision instrument approaches to Runway 12 and 30. As depicted on the Plan, current Airpark property boundaries do not necessarily include all portions of the Runway Protection Zones. Portions of the Runway Protection Zones located outside Airpark property should be acquired or controlled through avigation easements. The ultimate configuration of Runway 12-30 will require the acquisition of property outside existing property boundaries to accommodate the runway extension, safety area, and future RPZ.

The approaches to both runways are unobstructed. However, an access road to DOD facilities on the west side of the Airpark crosses through the RPZ for Runway 30 approximately 300 feet from the inner edge of the RPZ. The roadbed elevation is slightly lower than the runway threshold elevation. A vehicle height of 15 feet is assumed for vehicles travelling on public roadways. This access road has restricted access and is presently used only by DOD. Therefore, private roadway obstruction standards (10 feet) could be applied; control of vehicle traffic may also be required.

AIRPORT LAND-USE PLAN

The Airport Land-Use Plan (**Drawing 4**) depicts land areas surrounding the Airpark, land-use designations, and ownership. Twenty-year forecast noise contours are depicted to provide the sponsor assistance in establishing long-term land-use compatibility planning around the airport. The Land-Use Plan depicts the ultimate runway configuration, which includes a 10,000-foot runway. The northern extension of Runway 12-30 will require the acquisition of approximately 100 acres of state-owned property.

The Pinal and Pima County boundaries run along the southern property line. The majority of land surrounding the Airpark to the north, west, and east is state-owned and relatively undeveloped. The lands located directly south of the Airpark are located in Pima County and have an RH-1 land-use designation. RH-1 is identified as Single-Family Residential, with large lot areas. Based on forecast activity, it appears that only the 60 Ldn noise contour would extend beyond current or future Airpark boundaries. The 65 Ldn contour does not extend beyond the boundaries of the Runway Protection Zones; these areas have been recommended for acquisition. This action will protect the inner approach surfaces for obstructions, but would also ensure that incompatible land use would not encroach on critical airport areas. A detailed discussion of land-use and noise compatibility planning is provided in **Chapter Nine, Environmental Review.**



DESIGNATIONS

PIMA COUNTY

RH-1 – SINGLE FAMILY RESIDENCE (180,000 sq. ft.)

LAND USE COMPATIBILITY MATRIX

LAND USE CATEGORIES	COMMUNITY NOISE EQUIVALENT LEVEL (Ldn) 60	65	70
MOBILE HOMES	B	C	D
SINGLE-FAMILY, TOWNHOUSE, APARTMENT	B	C	C
HOTELS, MOTELS	A	B	C
SCHOOLS, CHURCHES, LIBRARIES	C	C	C
AUDITORIUMS, CONCERT HALLS	C	C	D
PARKS, PLAYGROUNDS	B	C	C
OFFICES	B	B	B
RETAIL COMMERCIAL, THEATRES, RESTAURANTS	B	B	B
WHOLESALE COMMERCIAL, LIGHT INDUSTRIAL	A	B	B
FARMING/GROVES	A	A	A

INTERPRETATION

ZONE A CLEARLY ACCEPTABLE – The noise exposure is such that the activities associated with the land use may be carried out with essentially no interference from aircraft noise. (Residential areas: both indoor and outdoor noise environments are pleasant.)

ZONE B NORMALLY ACCEPTABLE – The noise exposure is great enough to be of some concern, but common building constructions will make the indoor environment acceptable, even for sleeping quarters. (Residential areas: the outdoor environment will be reasonably pleasant for recreation and play.)

ZONE C NORMALLY UNACCEPTABLE – The noise exposure is significantly more severe, so that unusual and costly building constructions are necessary to ensure adequate performance of activities. (Residential areas: barriers must be erected between the site and prominent noise sources to make the outdoor environment tolerable.)

ZONE D CLEARLY UNACCEPTABLE – The noise exposure at the site is so severe that construction costs to make the indoor environment acceptable for performance of activities would be prohibitive. (Residential areas: the outdoor environment would be intolerable for normal residential use.)

LEGEND

- NOISE CONTOUR LINE
- AIRPORT PROPERTY BOUNDARY
- PINAL/PIMA COUNTY BOUNDARY
- ZONING DIVISION LINE

The preparation of this document was financed in part by a planning grant from the FAA as provided under Section 505 of the Airport and Airways Improvement Act of 1982. This document does not necessarily reflect the views of the FAA.

MAG. DEC. 12° 13' E (1985)

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SCALE IN FEET

FEDERAL AVIATION ADMINISTRATION	CITY OF MARANA, ARIZONA	PINAL AIRPARK MARANA, ARIZONA
APPROVAL DATE: ____ SEE APPROVAL LETTER: ____ SIGNATURE	APPROVAL DATE: ____ SEE APPROVAL LETTER: ____ SIGNATURE	**LAND USE**

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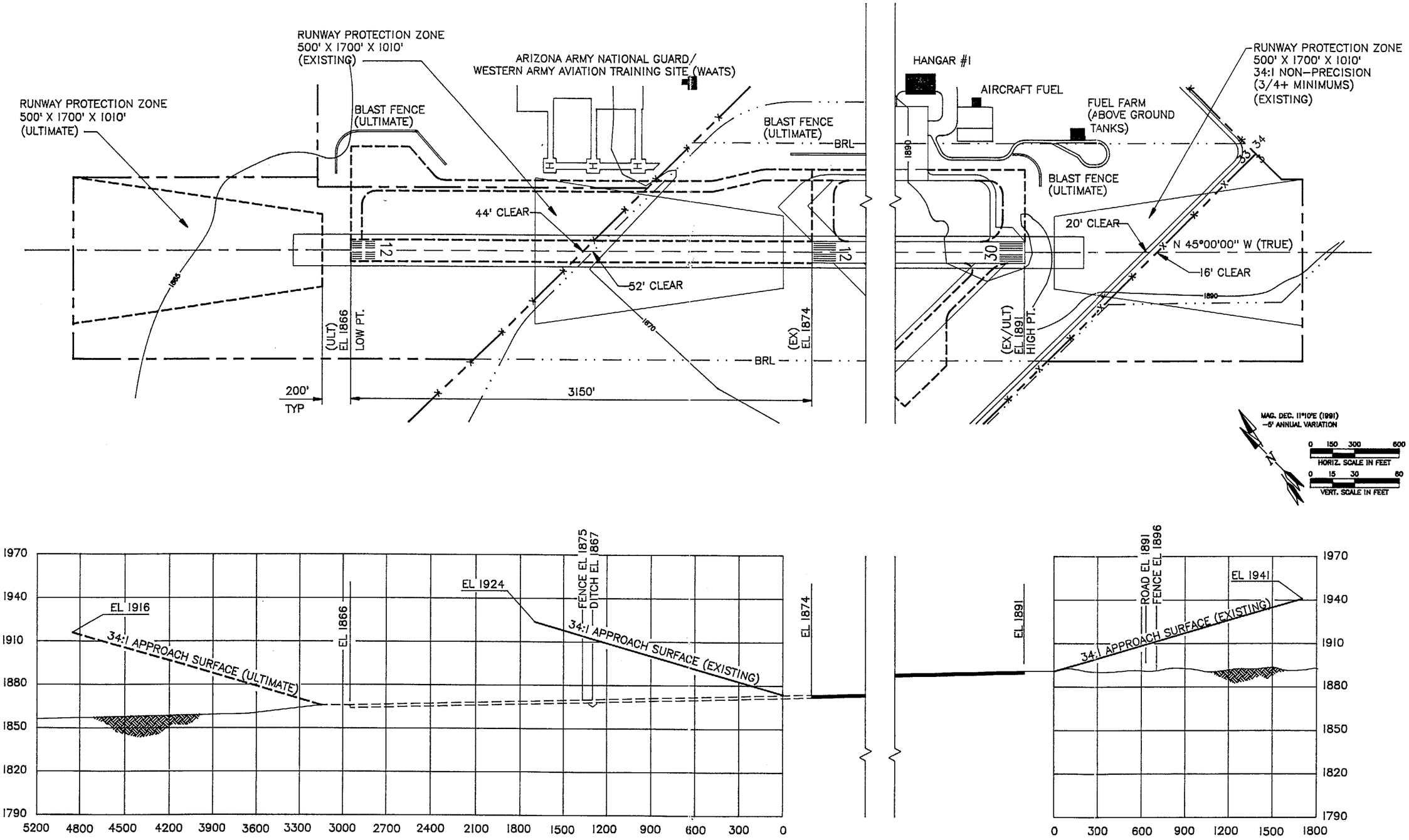
DRAWING 4



RUNWAY PROTECTION ZONE PLAN

PINAL AIRPARK

MARANA, ARIZONA

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DRAWN BY: A. PANDALEON
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DRAWING 3